

Proposed Changes to Specification and Claims

US Patent Appln. No. 10/044,281

Filed: January 9, 2002

For: INK CARTRIDGE FOR INK-JET
PRINTING APPARATUS

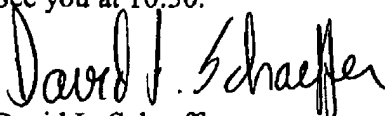
Examiner: Anh T.N. Vo

Group Art Unit: 2861

Examiner Vo:

Here are the proposed changes to the specification and claims that we would like to discuss with you on Thursday, November 6, 2003. These changes are tentative, whether they are made will depend on what we agree to during the meeting.

See you at 10:30.



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[0055] A convex portion 48 which is adapted to touch to the inner wall of the recessed part 21 of the cartridge holder 6 when the cartridge is properly positioned in cartridge holder 6 protrudes from bottom 43. Cartridge holder 6 is provided with a shape into which the convex portion can be inserted. Ink supply ports 30 for respectively fitting to the ink supply needles 10 are provided at the convex portion 48. Recessed parts 44-47 are formed on bottom 43 for receiving projections 12 to 16 ~~enprojecting from~~ the side of the cartridge holder 6. Recessed parts 44-47 are formed so that these ink supply ports 30 are put between the diagonal points of an imaginary quadrilateral.

[0085] Reference is now made to FIGS 23(a), 23(b) in which an embodiment of the invention to solve the above problems is provided. An ink cartridge 280 includes a plurality of ink housing chambers 81-85. A respective ink supply port 91-95 is provided in each housing chamber 81-85. It is desirable that a slant part 106 wider on the side of the ink housing chamber

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from the side of the ink supply port 93 is formed in a protruding part 105 which protrudes toward the ink housing chamber 83. A filter 104 is affixed to projection ~~104~~105 as shown in Fig. 23(b). The slant part 106 may be ~~areuated~~arcuate if desired, so that air bubbles may be guided more effectively to the ink supply port 93.

Amend claims 1 -4, 6-18, 20, 26-29 and add claim 30:

1. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, comprising:

a housing having at least one wall;

at least two ink chambers for containing different ink accommodated in said
housing;

and

a plurality of ink supply ports formed in the one wall of said housing within each
of respective said ink chambers, each of said ink supply ports having an inner opening and an
outer opening for receiving a respective one of the needles,

wherein a first center-to-center distance from said inner opening of a first ink supply port to that of a second ink supply port adjacent to said first ink supply port is different from a second center-to-center distance from said outer opening of said first ink supply port to that of said second ink supply port.

2. (Currently Amended) The ink cartridge of claim 1, wherein said first center-to-center distance is greater than said center-to-center second distance.

3. The ink cartridge of claim 1, further comprising:

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a plurality of ink supply passages respectively at least partly defining said ink supply port, each of said ink supply passages projecting inward into said housing from a bottom wall of said housing, said ink supply passages communicating with said respective ink chambers at an inner end thereof; and

a plurality of porous members each impregnated with ink and respectively fitted in each of said ink chambers and engaging with said ink supply port through said ink supply passage.

4. (Currently Amended) The ink cartridge of claim 1, wherein one of said ink chambers comprises three chambers separated from one another.

5. The ink cartridge of claim 1, wherein said ink chamber comprises five chambers separated from one another.

6. (Currently Amended) The ink cartridge of claim 3, wherein ~~said each of~~ said ink supply ports protrudes inward into respective said ink chambers and compresses said respective porous members.

7. (Currently Amended) The ink cartridge of claim 3, wherein each of said ink supply passages is disposed at substantially a center in a widthwise direction of said respective ink chamber when said ink cartridge is seen in a front view.

8. (Currently Amended) The ink cartridge of claim 6, wherein at least one said ink supply port has an angled surface that is arcuate.

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9. (Currently Amended) The ink cartridge of claim 6, wherein ~~said an~~ inner surface of said ink supply port is entirely angled.

10. (Currently Amended) The ink cartridge of claim 8, wherein the ink supply port has a protrusion member and the height of said protrusion member is higher~~greater~~ than ~~that of said a~~ height of a projecting edge when ~~said a~~ filter is secured onto said projecting edge.

11. (Currently Amended) The ink cartridge of claim 8, wherein ~~said protrusion member comprises two or more~~the ink supply port has a protrusion member that includes at least two elongated protrusions.

12. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

an ink cartridge main body;

a partition wall dividing the ink cartridge main body into a plurality of ink chambers having respective ink outflow ports;

a plurality of ink supply ports adapted to receive and connect to the respective ink supply needles, and disposed on a bottom surface of the ink cartridge main body so that ink in the ink chambers ~~can flow~~s from the ink outflow ports to the ink supply ports, respectively, wherein:

each of the ink outflow ports is disposed substantially on a central line of the corresponding ink chamber in a width direction thereof;

the ink supply ports of the ink chambers are arrayed in the same array pitch that is different from an array pitch of the corresponding ink outflow ports; and

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one of the ink supply ports, located at an end of the array, is disposed substantially on the central line of the corresponding ink chamber in the width direction thereof.

13. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

an ink cartridge main body;

a partition wall dividing the ink cartridge main body into a plurality of ink chambers having respective ink outflow ports;

a plurality of ink supply ports adapted to receive and connect to the respective ink supply needles, and disposed on a bottom surface of the ink cartridge main body so that ink in the ink chambers ~~can flow~~ from the ink outflow ports to the ink supply ports, respectively,

a plurality of through-holes, each at least one of the through-holes including a plurality of recessed portions offset one from another to ~~absorb~~compensate for a difference in array pitch between the ink supply ports and the ink outflow ports, wherein the ink outflow ports communicates via the through-holes with the ink supply ports, respectively.

14. (Currently Amended) The ink cartridge of claim 13, wherein the through-holes are ~~is~~-formed such that the plurality of recessed portion having respective different sizes are arranged with their axes not coincident with one another, in order to ~~absorb~~compensate for the difference in array pitches between the ink supply ports and the ink outflow ports.

15. (Currently Amended) The ink cartridge of claim 13, wherein each one of ~~the~~said ink supply ports contacts adjacent ~~one of the~~said ink supply ports.

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16. (Currently Amended) The ink cartridge of claim 15, wherein ~~a frame member is formed around an outer periphery of the ink supply ports, and connected to the ink supply ports by ribs~~ a portion of at least one said ink supply port located in the ink chamber has an inner surface and at least one groove is formed in the inner surface, the groove leading to the associated through-hole.

17. (Currently Amended) The ink cartridge of claim 14, wherein at least one of the recesses increases in size as portions of the recess that are closer to the ink supply port.

18. (Currently Amended) The ink cartridge of claim 14, wherein the through hole for communication between the ink supply port and the ink outflow port ~~having a large~~ that is offset ~~amount~~ from the ink supply port includes the recess which is adjacent to the ink outflow port and which is oval in section having a major diameter in the offset direction.

19. The ink cartridge of claim 14, wherein the through-holes are formed by abutting an upper molding die and a lower molding die against each other.

20. (Currently Amended) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

an ink cartridge main body;

a partition wall dividing the ink cartridge main body into a plurality of ink chambers having respective ink outflow ports;

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a plurality of ink supply ports adapted to receive and connect to the respective ink supply needles, and disposed on a bottom surface of the ink cartridge main body so that ink in the ink chambers can flow from the ink outflow ports to the ink supply ports, respectively, wherein:

an array pitch of the ink outflow ports is different from an array pitch of the ink supply ports;

the ink chambers communicates with the ink supply ports via respective through-holes, each formed as continuous recessed portions;

wherein the recessed portions are vertically arranged and are disposed so that their axes are offset from one another to absorb/compensate for a difference in array pitch between the ink supply ports and the ink outflow ports for at least one of the ink supply ports.

21. The ink cartridge of claim 13, wherein in each of the through-holes, a central axis of the recessed portion closer to the ink chamber is offset from a central axis of the recessed portion closer to the ink supply port.

22. The ink cartridge of claim 13 and 20, wherein the axes of the recessed portion are offset in the array direction of the ink supply ports.

23. The ink cartridge of claim 12, 13 or 20, wherein a protruding portion is formed in each of the ink chambers, a porous member is accommodated within each of the ink chambers so as to contact corresponding one of the protruding portions, and each of the outflow ports is opened at an apex portion of corresponding one of the protruding portions.

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24. The ink cartridge of claim 13 or 20, wherein each of the ink outflow ports is located substantially on a central line of corresponding one of the ink chambers in a width direction thereof.

25. The ink cartridge of claim 13 or 20, wherein the recessed portion located just below each of the ink chambers is located on a central line of the each ink chamber in a width direction thereof.

26. (Currently Amended) The ink cartridge of claim 12, 13 or 20, wherein the ink supply ports are arrayed in the same array pitch, and ~~entirely~~are offset toward an end of the array.

27. (Currently Amended) The ink cartridge of claim 26, wherein each one of ~~thesaid~~ ink supply ports contacts adjacent ~~one of the~~said ink supply ports.

28. (Currently Amended) The ink cartridge of claim 27, wherein ~~a frame member is formed around an outer periphery of the ink supply ports, and connected to the ink supply ports by ribs~~a portion of at least one said ink supply port located in the ink chamber has an inner surface and at least one groove is formed in the inner surface, the groove leading to the associated through-hole.

29. (Currently Amended) The ink cartridge of claim 20, wherein a positioning protrusion is formed on a side wall ~~forming~~of the ink chambers.

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30. (New) An ink cartridge for an ink jet printer having a plurality of ink supply needles communicating with a print head, the ink cartridge comprising:

an ink cartridge main body;

a partition wall dividing the ink cartridge main body into a plurality of ink chambers having respective ink outflow ports;

a plurality of ink supply ports adapted to receive and connect to the respective ink supply needles, and disposed on a bottom surface of the ink cartridge main body so that ink in the ink chambers can flow from the ink outflow ports to the ink supply ports, respectively, wherein:

each of the ink outflow ports is disposed substantially on a central line of the corresponding ink chamber in a width direction thereof;

one of the ink supply ports, located at an end of the array is disposed substantially on the central line of the corresponding ink chamber in the width direction thereof; and

at least another one of the ink supply ports is disposed offset from the central line of the corresponding ink chamber in the width direction thereof.